Digital Signal I& Image Processing / IT-SEM 7 / MAY'14

QP Code : MV-20316 **(3 Hours)** **[Total Marks : 100**

N.B.: **Q1 is compulsory.**
Write any four questions out of remaining six.
Assume suitable data wherever necessary.

Q1. Justify/contradict with reason. (20)

a) Unit step sequence is power signal.
b) Every image has unique histogram.
c) Extreme contrast stretching is thresholding.
d) All image compression techniques are invertible.
e) Laplacian is not a good edge detector.

Q2 a) What is discrete time system? Give classification of system based on properties of system. (10)

Q2 b) If x(n) = {2, -1, 3 , 0, 4} , find- (10)

i) x(-n) ii) x(-n+2) iii)x(n-1) iv)x(2n) v)x(n+1)

Q3 a) State and prove any four properties of DFT. (10)

Q3 b) Find linear convolution of the signals (10)

i) x(n) = {2 ,3, 0, 1} and h(n) = {1, 0, -1, 2}

ii) x(n) = {1,2,3,4,5,6,7} and h(n) = {1,0,2}

Q4 a) What is Morphology? Name and explain the basic operations of Morphology? (10)

Q4 b) For the given histogram state and prove what happens when equalized twice. (10)

Gray level :	0	1	2	3
nk :	70	20	7	3

Q5 a) Explain in detail image enhancement in spatial domain. (10)

Q5 b) Explain region based segmentation in detail. (10)

Q6 a) Give Huffman code for the following symbols (10)

Symbol :	0	1	2	3	4	5	6	7
Probability :	0.05	0.008	0.002	0.06	0.18	0.13	0.07	0.43

Q6 b) What is wavelet transform? Explain in detail. (10)

Q7. Write short note on any four. (20)

a) Homomorphic filter
b) Lossy compression
c) DCT
d) CBIR
e) Copyright marking.